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Statistical characterization of mixing induced by Richtmyer-Meshkov instability CHRISTOPHER TOMKINS, SANJAY KUMAR, GREG ORLICZ, KATHY PRESTRIDGE, Los Alamos National Lab — We quantitatively investigate mixing in the case of a heavy-gas (SF6) cylinder that is accelerated by a planar, Mach 1.2 shock wave. Concentration measurements of the heavy gas are acquired using planar laser-induced fluorescence (PLIF). The quantitative nature of the data permits a host of analysis, including estimation of the local mixing rate. The effects of the primary and secondary instabilities are revealed; these include the expected increase in molecular mixing due to increased stirring associated with transition to turbulence, and elevated mixing rate in pre-turbulent regions due to intensification of concentration gradients along stretched interfaces. Wavelets are used to characterize the transfer of energy between scales as a function of time.

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